INSTITUT FRANÇAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION

CHRONOCULTURAL SIGNIFICANCE OF 14 C AND TL DATINGS IN NORTH CAMEROON IRON AGE SETTLEMENTS A CASE REFLEXION UPON THE RELIABILITY OF ABSOLUTE DATING

Alain MARLIAC

Département Société, Développement, Urbanisation

AXE 1 "PATRIMOINES ET IDENTITES"

DOCUMENT DE TRAVAIL N° 5

JUILLET 1988

IId International Symposium "Archaeology and 14 C"

Groningen, Sept. 87

Biological Archaeological Institute and Isotope

Physics Laboratory

University of Groningen, The Netherlands.

CHRONOCULTURAL SIGNIFICANCE OF 14 C AND TL DATINGS IN NORTH CAMEROON IRON AGE SETTLEMENTS A CASE REFLEXION UPON THE RELIABILITY OF ABSOLUTE DATING

A. Marliac

ORSTOM, Institut Français de Recherche Scientifique pour le développement en Coopération, Laboratoire d'Archéologie Tropicale et d'Anthropologie Historique, 70 Route d'Aulnay, 93140 BONDY, France

Abstract: Absolute datings cannot be immediately used for chronocultural purposes. From the study of the sequences obtained on Iron Age sites in North Cameroon, Central Africa, we came to the conclusion that, for archaeological objectives, an absolute dating coming or not from an archaeological context bears no significance unless analyzed from an archaeo-anthropological point of view. This conclusion is an invite for a real joint and even field approach to the problems of absolute dating in prehistory by physicists and archaeologists.
Key words: 14 C dating, TL dating, Iron Age, North Cameroon, Africa, chronocultural significance.

Résumé: Les datations absolues ne peuvent être utilisées telles quelles pour dater des cultures. A partir des séquences réalisées sur des sites de l'Age du Fer au Nord du Cameroun,nous sommes parvenus à la conclusion qu'une datation absolue utilisée pour des buts archéologiques, qu'elle provienne d'échantillons dans ou hors contexte archéologique, n'a pas de signification en dehors d'une interprétation archéo-anthropologique. Cette opinion est une invite pour une approche conjointe réelle des problèmes de la datation absolue par les physiciens et les archéologues.

Mots clés: datation 14 C, TL, Age du Fer, Cameroun du Nord, Afrique, signification chronoculturelle.

The three sequences of datings (Laboratories references and calibrations in Marliac A., 1985, 1987a, 1987b) shown Tables I, II and III come from test pits made in Iron Age settlements discovered in the Diamaré region of North Cameroon. This region was "terra incognita" before, as well as so many other vast areas of Central Africa... Roughly speaking these settlements occur as light up-raisings of river banks in the Central Diamaré and bigger up-heapings in the Logone zone (cf map 2). They can all be termed "settlement mounds" made of the piling up of varied architectural debris, refuse, sherds, ashes, pits, burials, some floors, stones and so on...

Apparently the datings cover the whole of the archaeological sequences, more regularly at Mongossi and Goray than at Salak. Does this mean that the cultures discovered, analyzed and thus defined by archaeological methods from the data collected in the pits are "dated"? In other words are the datings significant for the archaeologist's point of view which is prominently chronocultural? And this raises another question: what is really analyzed and then given a "date"? The first two questions raise the problem of the level of significance retained for archaeological purposes. The third one raises the problem of more or less strong anthropic dimension that biases the significance of the samples. From a more general (theoretical) point of view: can cultures be dated by absolute datings?

-I-

Obviously at a regional level including Northern Nigeria and Southern Chad where few datings are available, the three Tables can be taken as sets bringing chronological information totally new and relevant for general reflexions upon

the prehistoric/historic evolution of the area (Iron Age cultures/historic cultures). Thus, we can consider after a choice which is explained elsewhere at length (Marliac A., 1985,1987a, 1987b) that the time span concerned by the Mongossi culture is Xth AD-XVIIth AD, that the time span concerned by the Salak culture (Salak and Goray) is VIth AD-XIIIth AD. Clearly, these late Iron Age cultures must be relevant for the following historic human occupations of the subregion... Consequently, the sets of datings can be taken as significant and one can deduce for instance new hypotheses and explanations on the earliest historic peoplings of the area. From this angle of view, 14 C absolute datings as well as TL absolute datings can be considered reliable.

- II -

If we come to a more precise level, that of the pits in our three sites the situation becomes more complex :

a) charcoal is not regularly distributed from one end to the other end of the pit, sherds too. In effect, charcoal is sometimes unusable (quantity) or missing, and sherds have to be picked up in particular locations (Aitken M.J. 1972). Consequently in some cases datings cannot be made and the sequences exhibit "gaps".

b) Had it been regular, the distribution itself could not refer to a stratigraphic sequence as the formation of the matrix IS NOT a regular process but an anthropogenic one (and also because the pit has been dug through just a part of the mound). The site cannot be considered as a regular sequence of what could have been called "anthropic layers". It is better seen as the succession of the different parts of different habitats *stricto sensu* These successive habitats

being in rotation one above the other and, moreover, being partly mingled by intrusive structures and various takings of material (for new constructions for instance)...

E.g. : case floors, hearths, case surroundings, refuse zones, refuse natural or dug pits, kitchens, burials, etc... all this having collapsed, having been buried, dug through bottom layers, abandonned, eroded and re-scattered/re-spread, then capped by other different parts of a new occupation possibly differently organized or even culturally at variance...

c) Once the site has been abandonned (and this can occur many times before the site is actually and definitely left), it began to evolve under external and internal natural conditions, these ones being, at least partially, biased by the man-made structure of the mound...

d) Climate will either protect or modify the site depending on the type and seasonal distribution of the rains.

E.g. : we can imagine ablation of the first layers in instable topographic position then denudation of internal layers turning either to hardened soils or to gullies or possibly to sherds-protected surfaces... Also, the remnants of man-made structures as well as the possible cracking of clayed material can exaggerate water percolations.

e) The fauna (see the mounds named "hyena hole" (*ngaska fowru* : in local fulani language) and especially but not only, the microfauna, can induce internal circulation of waters and materials (including sometimes artefacts themselves)

f) The soil itself, thanks to its special anthropic nature, will evolve through aggregations, migrations, neoformations...

We are not going to list here all the possible scenarios of intrasite evolution (bio-chemico-physicoturbations...) in a TOTALLY ANTHROPIC SITE, either all the possibilities of habitats compositions and successions. It appears clearly, however, that each sample may be polluted and that the distribution of the samples in each site can be also polluted as well as disturbed. The materials sampled for datings are complex by nature. What we date is AT THE SAME TIME under the heading of physics, natural sciences and of anthropology. It has to be grasped from these three points of view as it belongs to these different orders of phenomena.

E.g. : a piece of carbonized wood beyond its physical and botanical definition should be precisely localized in space, then localized within the structuration of the site (under, above, coming from, close to...) these structures being then interpreted in anthropological terms through models.

To identify all the parameters of even one sample (parameters of which we gave but a short list!) seems out of reach. Just a few are actually seizable.

- III -

With regard to our sequences:

a) each result has been examined within the site structuration as carefully as possible. Observations from Laboratories were taken into account too (e.g.: quantity...)

b) we decide to take a medium position taking into account that circulation of samples or of samples polluting materials in this type of site should not exceed one meter deep on an average (with some exceptions). Therefore there must be a chronological logic in the datings distribution within the pits boundaries.

In fact this decision was based on the observed distribution of the datings at hand from the three sites excavated. This distribution shows:

- albeit inverted according to a looping mode, the datings are organized in chronological order from the bottom up to the mougth of the pit: *grosso modo* the earliest are towards the bottom, the latest towards the top;
- put along a chronological line (wide diverging datings being excluded) they exhibit a continuum which gives a reasonable span of time for cultures duration: six, seven centuries.

Thus, the periods cited in part I, were retained as the most acceptable on internal site considerations. Moreover they were accepted after collation with the established cultural sequences (pottery typology).

c) The sequences were then approved on external considerations, i.e. interpreted in terms of regional prehistoric/historic cultures duration and presence.

- the sets of datings were considered reliable in comparison with regional historic datings (oral traditions) and the rare absolute datings at our disposal (P. de Maret, 1985) but;
- the diverging datings have to be interpreted in comparison with other datings (absolute for the lower limit of the sequence, historic for the upper limit);
- the sets retained as well as the diverging datings have of course to be confirmed or not by many other datings.

The two last points are far from being satisfactorily solved nowadays.

- IV -

The preceding quick look at our North Cameroon situation, explained at which level of significance we chose to use absolute datings for our archaeological purposes according to the samples reliability and the overall prehistoric and historic knowledge in the area.

It is risky to bring together, from a general point of view, phenomena belonging to totally different fields of research. It has been possible in our situation - keeping in mind the necessity of further improvements - because we find ourselves at the intersection of the three fiels of research (physics, natural sciences, anthropology): common stratification-deposition. Moreover some of the samples are man-induced or man-started (burning of pottery, hearths, bush fires...). This case is far better than those where samples are not man-induced (but intimately linked with cultural vestiges) and those where samples are not man-induced and just stratigraphically linked with vestiges (the datable stratum lying for instance, two meters apart from the archeaeological horizon).

But even in our case, absolute datings do not really "date" the cultures, but, rather the time of deposition (possibly disturbed) of samples and cultures items, or the starting of individual cultural events (pottery making).

Are cultures datable in terms of a beginning or and end? Are cultures durations really measurable (e.g. : what sort of relation can exist between the date of charcoal making and the culture which made it in its hearths?)

We could conclude that absolute datings give only landmarks for cultures durations. In the best case, the more intimate and accurate their three definitions are, the more secure the landmarks are, but, also, the heavier the

cultural bias can be! The more numerous the datings are the greater the chance of approaching the chronological bounds of a culture if there are any... In the other cases, absolute datings will remain landmarks whose utilization within the anthropological interpretation is subordinate to their more or less great number and accuracy..

Références

Aitken, M;J; 1972, *Thermoluminescent dating. Notes on collection of potsherds.* Revised January.

Marliac, A., 1982a, *Recherches ethno-archéologiques au Diamaré, Cameroun Septentrional,* ORSTOM, Travaux et Documents N° 151, 91 p.

Marliac, A., 1982b, *L'Age du Fer au Cameroun Septentrional : données chronologiques nouvelles sur le Diamaré.* Jour. Soc. Africanistes 52, 1-2 : 59-67.

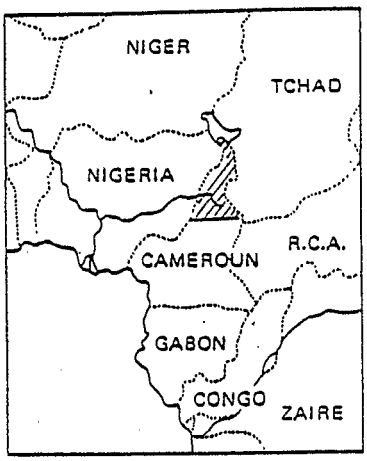
Marliac, A., 1985, *L'Age du Fer au Cameroun Septentrional : rapport préliminaire sur le site de Salak au Diamaré.* Multigr. ORSTOM-MESRES, 235 p. (Revised version to be published).

Marliac, A., 1987a, *L'Age du Fer au Cameroun Septentrional : rapport préliminaire sur le site de Mongossi dans la plaine du Logone.* Multigr. ORSTOM-MESRES, December 1987.

Marliac, A., 1987b, *L'Age du Fer au Cameroun Septentrional : rapport préliminaire sur le site de Goray au Diamaré.* Multigr. ORSTOM-MESRES, December 1987.

De Maret, P., 1985, *Recent archaeological research and dates from Central Africa.* Journ. of African History XXVI : 129-48.

(1) GENERAL SITUATION



500 m Contour

320 m Bama ridge

400/420 Watershed limit Niger, Chad

Lake Tchad

14°

Yaéré

Ngétchéwé

N

Tsanaga

MAROUA

Boula

Logone

Mandara Mts

Fianga Lake

10°

NIGERIA

Louti

Kébi

Léré Lake

GAROUA

Kébi

TCHAD

Faro

Alantika Mts

Déo

Poli Mts

Rey

Bénoué

8°

Adamaoua Plateau

0 100 km

SPIT I					SPIT XI			
Alt.	Ref.	Age B.P.	Age A.D.	Chronolog. order	Alt.	ref.	Age B.P.	Age A.D.
-46cm	TL2	385/396	1596	9				
				7	-40cm	RC12	910±90	1080±90
-70	RC4,5,6	210±60	1740±60	11				
-78	TL3	930	1050	6				
-116	TL4	1820	-	-				
-150	RC11,16	910±90	1080±90	7				
-163	TL5	797/816	1184	8				
-180	TL6	364/373	1617	10				
-210	RC13	1280±125	670±125	4				
-220	RC15	1165±90	785±90	5				
-332	TL13	1490	490	1				
	TL12	1380	600	3				
-373	TL14	1470	510	2				

Table I:Absolute datings for Salak I and Salak II(uncalibrated).

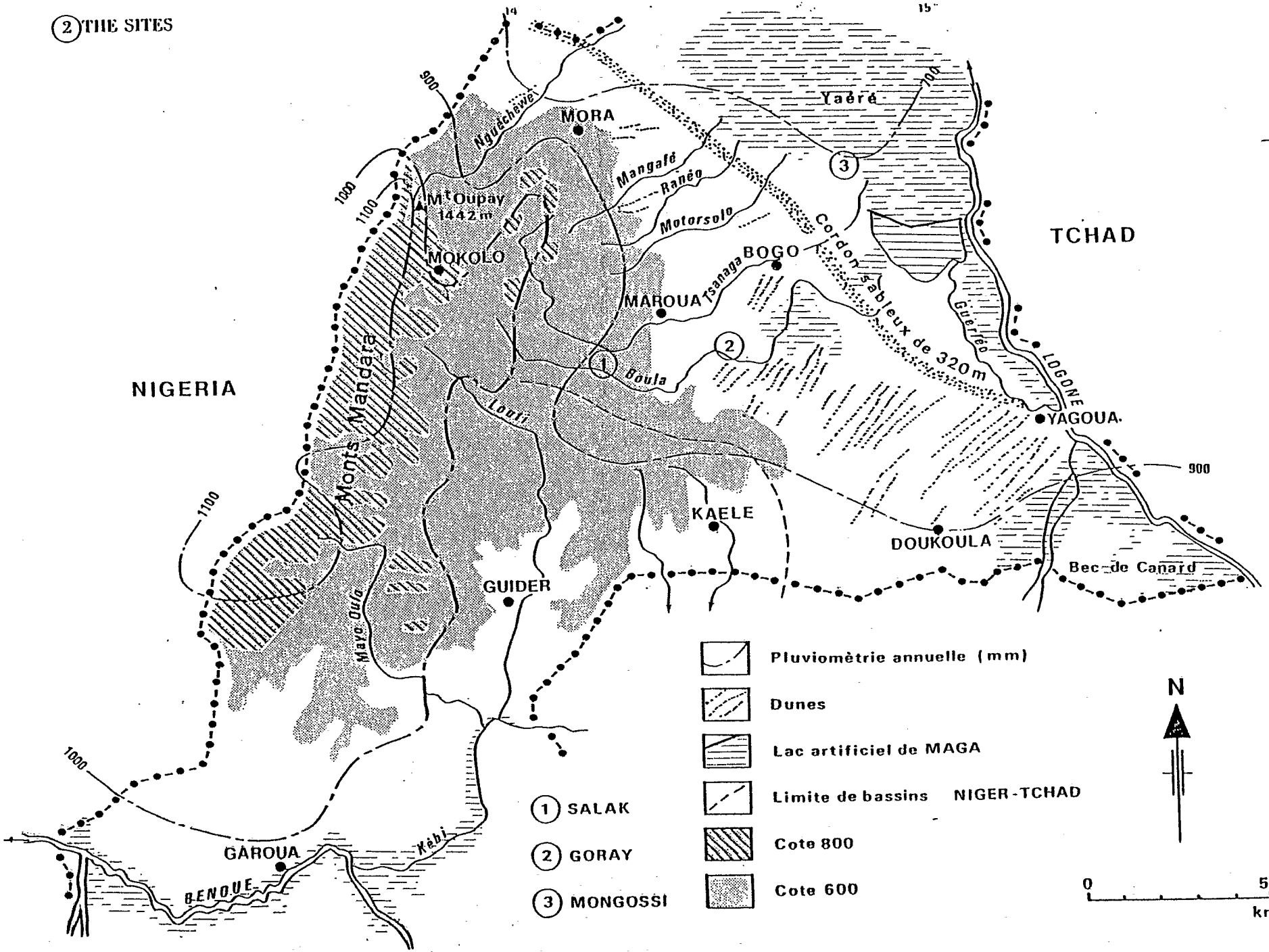
Alt.	Ref.	Age B.P.	Age A.D.	Chronological order
-46cm	TL79.5	247/241	1736	25
50	TL82.1	612±43	1379±43	16
	RC79.3,4	590	-	-
80	TL82.2	775±41	1208±41	12
95	RC82.2	870±80	1080±80	10
105	TL79.7	373/365	1608/1616	24
	TL79.8	574/559	1407/1422	19
106	RC82.12	610±75	1340±75	17
175	RC82.6	910±180	1040±180	8
	TL79.17	426/420	1555/1561	23
180	RC82.9	870±110	1080±110	9
190	RC82.20	750±200	1200±209	14
200	RC79.37	1180±120	770±120	5
220	RC80.6	920±60	1030±60	7
250	TL79.18	592/570	1358/1411	18
275	TL82.9	804±49	1177±49	13
306	TL79.20	1071/1045	910/936	2
329	RC82.30	920±120	1030±120	6
	TL82.10	806±38	1175±38	12
340	RC82.31	470±105	1480±105	22
355	RC80.10	1030±80	910±80	3
360	RC82.33	745±150	1205±150	15
	RC82.33	1595±450	355±450	-
365	RC82.34	945±75	1005±75	5
415	TL82.12	500±30	1481±30	21
		525±42	1456±42	20
	TL82.13	996±53	985±53	4
450	RC82.37	2890±245	940±245 b.c.	river terrace
	RC82.37b	3260	1310 b.c.	b.c. Ic

Table II:Absolute datings for Ciray 79,80 and 82(uncalibrated).

SPIT I					SPIT II			
Alt.	Ref.	Age B.P.	Age A.D.	Chronolog. order	Alt.	Ref.	Age B.P.	Age A.D.
-55cm	TL3	670±40±50	1371±40±50	(2)	-15	RC25	1355±600	395±600
		598±31±42	1383±31±42	13 15	55	RC26	450±95	1500±95
65	TL4	848±44±60	1133±44±60	7 9	70	TL25	778±36±52	1203±36±52
80	RC4,4b	560±70	1390±70	14				
95	RC5	1905±255	-					
110	RC7	440±60	1510±60	16				
140	RC10	915±85	1035±85	5 10	150	TL33	776±34±51	1205±34±51
213	TL15	812±44±58	1168±44±59	8				
300	TL19b	851±44±60	1130±44±60	6				
	RC18	715±85	1235±85	11				
360	RC23,23b	1600±60	350±60	1				
410	TL30	1453±67±98	528±67±98	4				
		1481±63±96	500±63±96	3				

Table III:Absolute datings for Hongoori I and Hongoori II(uncalibrated).

(2) THE SITES


14°
15°
11°
10°
900
1000
1100
Nguachewel
MORA
Yaéré
Mangafé
Ranéo
Motorsolo
M' Oupay
1442 m
MOKOLO
MAROUA
Tsanaga
BOGO
Cordon sableux de 320 m
Guerléo
TCHAD
NIGERIA
Monts Mandara
Boula
Louti
LOGONE
YAGOUA
KAELE
DOUKOULA
Bec de Canard
GUIDER
Maya Oulo
GAROUA
Kébi
BENOUE
(1) SALAK
(2) GORAY
(3) MONGOSSI
Pluviométrie annuelle (mm)
Dunes
Lac artificiel de MAGA
Limite de bassins NIGER-TCHAD
Cote 800
Cote 600
N
0
50
km

213, rue Lafayette - 75010 PARIS - Tél. : (1) 48 03 77 77 - Télex ORSTOM 214 627 F